



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,367	10/28/2003	Oswin Ottinger	SGL 02/24	5955
24131 7590 03/23/2007 LERNER GREENBERG STEMER LLP P O BOX 2480 HOLLYWOOD, FL 33022-2480			EXAMINER VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT 1751	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			03/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/695,367	Applicant(s) OTTINGER ET AL.	
	Examiner Kallambella Vijayakumar	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/09/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 4, 9 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1751

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/11/2006 has been entered.

The information disclosure statement (IDS) submitted on 12/05/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

Claim 1 was amended. Claims 1-13 are currently pending with the application.

Applicant's arguments filed 11/09/2006 have been fully considered along with the amendment that overcomes the rejection under 35 USC 112-I paragraph in the office action mailed 08/09/2006. The arguments further overcome the prior art by Bonin and Neuschutz cited in the office action mailed 08/09/2006.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1751

1. Claims 1, 7-8 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108; PTOL-892).

The prior art teaches a shape stabilized latent heat storage device comprising SBS rubber, paraffin (PCM) and expanded graphite (EG) in the ratio of 80:20:5/3 parts by weight respectively (Page-103, Abstract; Page 104, Sec. 2.1 and 2.3; Pg-105, Section 2.5; Page-106, Sec 3.2). The particle size of the expandable graphite was 300 microns. Paraffin meets the limitation of PCM in claim-7.

With regard to claims 8 and 10-11, the prior art teaches making a cylindrical device by mixing EG with molten paraffin/PCM and molding the composition in to cylinder (Page-104, Sec. 2.3, Page-105, Sec 2.5). All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1, 7-8 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bader (Thesis, Univ. Auckland, February 2002).

The prior art teaches a thermal energy storage composition comprising paraffin wax and expanded/exfoliated graphite powder (Pg-11; Table 3.1-1; Pg-18, Table 3.2-1), and this meets the limitation of claims 1 and 7. The exfoliated graphite had a particle size of less than 12 micron for UF2 96/97 and less than 45 micron for EDM 96/97.

With regard to claims 8 and 10-11, the prior art teaches making a PCM by mixing the components, melt blending the components and forming a pellets (Page-15) and shaping the product by melt injection (Page-16). All the limitations of the instant claims are met.

The reference is anticipatory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1751

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108).

The disclosure by Xiao et al on the composition and making of the a latent heat storage device as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art is silent about the volume % of EG per claim-2 although it teaches a wt% composition, and the bulk density of the expanded graphite in claims 5 and 6.

The prior art teaches using a commercially available expanded graphite with a particle size of 300 micron in the composition after exfoliation and such materials have a typical density of 2-7 g/l and a particle diameter of less than 500 microns (Tamme, Workshop on Thermal Storage for Trough Power Systems, Feb. 20-21, 2003, Golden CO, Page-17) and the instant claimed vol% and bulk densities would be obvious in the art composition.

Art Unit: 1751

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108) in view of Neuschutz et al (US 2002/0033247).

The disclosure by Xiao et al on the composition and making of the a latent heat storage device as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art fails to teach the addition of a nucleating agent per claim-3.

In the analogous art, Neuschutz et al teach the addition of axillaries such as nucleating agents to the compositions containing liquid-solid PCM's containing graphite (Para 0035; 0040-0041).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to include nucleating agents in the latent heat storage device of Xiao with reasonable expectation of success because it is a solid-liquid type PCM device and the combined prior art teaching is suggestive of the claimed composition.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108).

The disclosure by Xiao et al on the composition and making of the a latent heat storage device as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art is silent about making the device by molding per claim 12.

However, the prior art teaches molding the product into a shape and it would have been obvious to use common molding techniques such as injection molding which was commonly used for molding graphite products at the time of the disclosure of the invention by the applicants (Hayward, US 5,882,570, Abstract).

4. Claims 2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bader (Thesis, Univ. Auckland, February 2002).

The disclosure by Bader on the composition and making of the a latent heat storage device as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

Art Unit: 1751

The prior art is silent about the volume % of EG per claim-2 although it teaches a wt% composition, and the bulk density of the expanded graphite in claims 5 and 6.

The prior art teaches using a commercially available expanded graphite with a particle size of either less than 15 microns or less than 45 microns and such materials have a typical density of 2-7 g/l and a particle diameter of less than 500 microns (Tamme, Workshop on Thermal Storage for Trough Power Systems, Feb. 20-21, 2003, Golden CO, Page-17) and the instant claimed vol% and bulk densities would be obvious in the art composition.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bader (Thesis, Univ. Auckland, February 2002) in view of Neuschutz et al (US 2002/ 0033247).

The disclosure by Bader et al on the composition and making of the a latent heat storage/PCM device as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art fails to teach the addition of a nucleating agent per claim-3.

In the analogous art, Neuschutz et al teach the addition of axillaries such as nucleating agents to the compositions containing liquid-solid PCM's containing graphite (Para 0035; 0040-0041).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to include nucleating agents in the latent heat storage device of Bader with reasonable expectation of success because it is a solid-liquid type PCM device and the combined prior art teaching is suggestive of the claimed composition.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bader (Thesis, Univ. Auckland, February 2002).

The disclosure by Bader on the composition and making of the a latent heat storage device as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art is silent about making the device by molding per claim 12.

However, the prior art teaches molding the product into a shape by melt injection, and it would have been obvious to use common molding techniques such as injection molding which was commonly used

Art Unit: 1751

for molding graphite products at the time of the disclosure of the invention by the applicants (Hayward, US 5,882,570, Abstract).

Allowable Subject Matter

Claims 4, 9 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art neither teaches nor fairly suggest a mixture containing particles of expanded graphite, PCM and the specific amount of the nucleating agent in the mixture or making a heat storage device by mixing the particles of EG and PCM or making the device using a jolting molding.

Conclusion

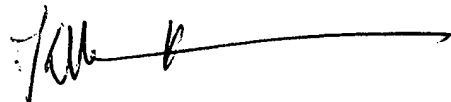
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV
March 02, 2007.


PATENT EXAMINER